North Carolina Department of Transportation
Highway – Railroad Interconnection and Preemption Inspection Form

Date of Inspection: _____ Inspected By: _____

Signal Inventory No.: _____ DOT Crossing No.: _____

Railroad Co: _____ RR Representative: _____

Date of Last Inspection _____ RR Rep. Phone: (_____)_____

Division: _____ County: _____ City or Town: In / Near _____

Traffic Controller (Manuf/Model) _____ Traffic Cabinet (Manuf/Model) _____

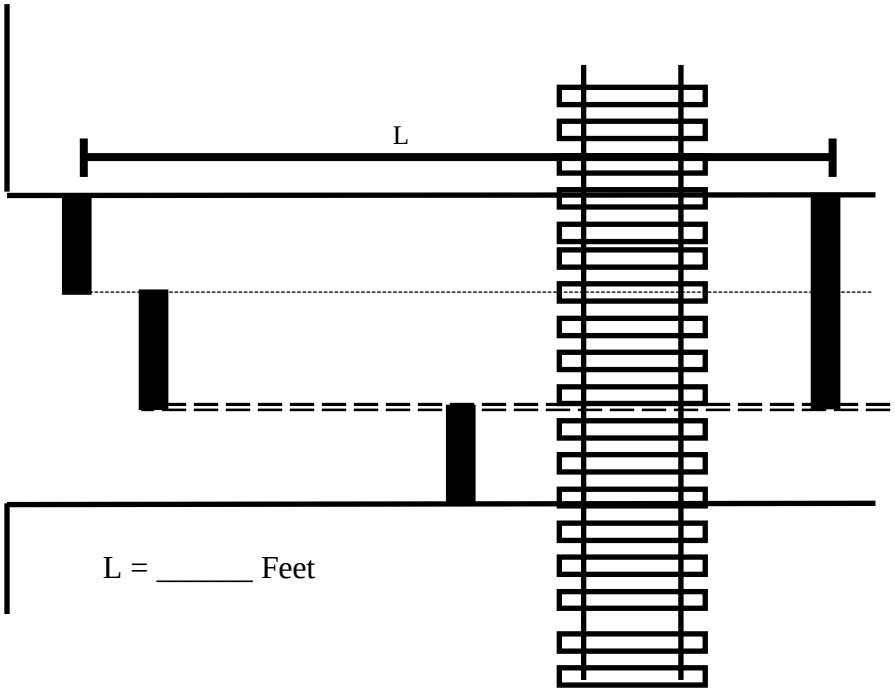
Intersection Location

Route Number: _____ Name: _____
at
Route Number: _____ Name: _____

Railroad Milepost _____

1. Calculate track clearance green by current standard (Greenshield's formula).

Distance To Measure In Order To Calculate Track Clear Green Time



If an approach has multiple stopbars, measure the distance from the stopbar behind the track to the farthest stopbar (closest to intersection).

Measure from stopbar behind track to stopbar at intersection. If calculation is less than 10 sec., use 10 sec. minimum.

a.) Insert distance L into formula below:
2 sec. x L/20 (L = distance divided by 20 feet per car)
+ 4 sec. (Start-up delay)
_____ Seconds = Greenshield's Formula Calc. for **TRACK CLEARANCE GREEN.**

b.) If **SIMULTANEOUS PREEMPTION** is used, record the calculated value shown in item **1(a)** (above) in the TRACK CLEARANCE GREEN section in the chart under item 2 (below) and skip items **1(c)** and **1(d).**

c.) If **ADVANCE PREEMPTION** is used, the RIGHT OF WAY TRANSFER TIME must be calculated and added to the Greenshield's calculation to determine the total amount of TRACK CLEARANCE GREEN time (see item **1(d)** below):

d.) If ADVANCE PREEMPTION is used, calculate **RIGHT OF WAY TRANSFER TIME**:

_____ Min Green Before Preempt
\+ _____ Ped Clear Before Preempt
\+ _____Yellow Clear Before Preempt
\+ _____ Red Clear Before Preempt

Amount of **RIGHT OF WAY TRANSFER TIME** = _____ Seconds

GREENSHIELD'S Formula Green [From **1(a)]** + _____ Seconds

Total Amount of **TRACK CLEAR GREEN TIME** = [ ] Seconds (Record this time in chart below in item 2 beside TRACK CLEARANCE GREEN).

e.) Is the calculated **TRACK CLEARANCE GREEN** time above for the type of preemption used at this crossing (advance or simultaneous), consistent with what is shown on the signal plans and/or programmed in the field? **Yes** **No**

2. Calculate the **PREEMPTION TIME REQUIRED**:

Function	Seconds
Delay Time	
Ped Clear Before Preempt*	
Min Green Before Preempt	
Yellow Clear Before Preempt	
Red Clear Before Preempt	
Track Clearance Green	
Track Clearance Yellow	
Track Clearance Red	
Preemption Time Required	

***Note:** PED CLEAR BEFORE PREEMPT should be timed concurrently with YELLOW CLEAR BEFORE PREEMPT. Enter only the exclusive amount of PED CLEAR time that is not displayed concurrently with the YELLOW CLEAR (ex. 5 sec. Ped Clear – 4.5 sec. Yel. Clear = .5 sec.).*

—Enter the above PREEMPTION TIME REQUIRED in **Item 15(a)** of this form—

3. OBSERVE OPERATION of the signal (including control equipment in the cabinet and field equipment) for proper programming & operation. Is equipment operating properly and does the operation coincide with the signal plans? **Yes** **No**

a) Are signs shown on signal plan installed properly? **Yes** **No**

4. If intersection has MULTIPLE PREEMPTS in use, verify that the RAILROAD PREEMPT is set as the **HIGHEST PRIORITY**. **N/A** **Pass** **Fail**

5. If crossing has multiple through line tracks — perform **SECOND TRAIN SEQUENCE** test (preempt re-service). **N/A** **Pass** **Fail**

a) Does **preempt call release** immediately when gates **begin** to rise? **Pass** **Fail**

6. Identify the general type of railroad signal equipment with its particular reaction time:
Circle type: PREDICTOR — MOTION — AC/DC — AFO

Manuf.: _____ Model: _____ Reaction time: _____Seconds

Note: *Reaction time will be used in RR WARNING TIME formula* ***(item 10)****. If reaction time cannot be obtained, use 5 seconds as worst case.*

7. Obtain the **TRACK CIRCUIT APPROACH LENGTHS** for each direction as shown on PLAN OF RECORD in the railroad signal cabinet:

From Plans – Northbound/Eastbound approach: _____ Southbound/Westbound approach: _____

8. Measure **TRACK CIRCUIT APPROACHES** from edge of travel lane to terminating shunt for each direction — ***Note:*** *Measurement is not required if no changes have been made to track circuits by RR Company since last inspection. Record most recent measurements with date of measurement in blanks provided below:*

Measured in Field – Northbound/Eastbound approach: _____ Southbound/Westbound approach: _____

Date Last Measured: _____

9. Obtain **MAXIMUM TRAIN SPEED** for the crossing from railroad signal maintainer / inspector (*using Timetable Speed or Railroad Permanent Speed Restriction*):

Railroad Northbound / Eastbound approach: _____ MPH

Railroad Southbound / Westbound approach: _____MPH

10. Calculate amount of **RR WARNING TIME** provided by track circuitry as calculated using the formula below (use space provided at bottom of page to aid in calculation):

(Shortest Approach Length) (Minus) Equipment Reaction Time = **RR Warning Time**
(1.47) (Train Speed in MPH)

$\frac{\square}{\square}$ minus $\square$ = $\square$ Seconds **[Carry to item 15(c)]**

(1.47) $\square$

11. Is crossing signal equipped with **ADVANCE PREEMPTION**? **Yes** **No**

Note: If ADVANCE PREEMPTION is used, a train movement must be observed. Care must be taken to answer items 12 & 12(a & b) below. *If SIMULTANEOUS PREEMPTION is used, a train movement observation is not required; however, if train movement occurs during inspection, enter actual observed warning time (taken with stopwatch) in* ***item 12****.*

12. Observed total warning time of **ACTUAL TRAIN MOVEMENT:** **N/A** _____ Seconds

a) Does controller/cabinet RESPOND TO PREEMPT CALL properly? **Pass** **Fail**

b) During train movement, does signal remain in TRACK CLEARANCE GREEN until entrance gate is fully horizontal? **Pass** **Fail**

13. If no train movement is expected, activate crossing with a shunt placed across the rails in the island circuit ***(this item may be omitted if train movement is observed):***

a) Observe traffic **signal preemption** & **crossing** operation. **N/A** **Pass** **Fail**

14. If Railroad crossing signal equipment is designed for CONSTANT WARNING TIME (i.e. predictor) and/or is equipped with ADVANCE PREEMPTION obtain the following values:

a) How much **RR WARNING TIME** is programmed in the unit? _____ Seconds

b) If railroad provides ADVANCE PREEMPTION, how many seconds of additional **DAX TIME** is programmed (DAX time minus warning time). _____ Seconds

15. Compare **PREEMPTION TIME REQUIRED** with **RR WARNING TIME**:

a) PREEMPTION TIME REQUIRED **(from Item 2)**: _____ Seconds

b) Total RR WARNING TIME programmed on railroad predictor (if used). **Total from Item 14(a) + 14(b):** _____ Seconds

c) Total Warning Time avail. from TRACK CIRCUITRY **(From Item 10)** _____ Seconds

CONCLUSION

- Is **15(c)** GREATER THAN OR EQUAL TO **15(b)**? **Yes** **No**
- Is **15(a)** LESS THAN OR EQUAL TO **15(b)** and **15(c)**? **Yes** **No**

If the answer to either of the above questions is NO, contact the Signal Design Section immediately at (919) 773-2800

Send copy of this **INSPECTION FORM** with **ATTACHED COMMENTS** (if necessary) and any marked-up plans to:

Mail: NCDOT – Transportation Mobility and Safety Division
Signal Design Section
ATTN: _____Region Signal Engineer (Specify Eastern, Central or Western Region)
1561 Mail Service Center
Raleigh N.C. 27699-1561

Office/ Delivery: 750 North Greenfield Parkway
Garner, NC 27529